

**Amendments to the Claims:**

The listing of claims below will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (currently amended): A ~~photosensitive glass~~ thin film of ~~thermally-assisted, organometallic,~~ derived from a thin film of photosensitive sol-gel derived glass doped with an organometallic photosensitizer, said organometallic photosensitizer having a formula including R-M-X, inclusions where X is a photolabile moiety, M is a metal, and R is a volatile organic compound, wherein said thin film having of photosensitive sol-gel has a thickness in excess of one micron, is exposed to light in at least one region to unbind X constituents from M constituents of said photosensitizer within said at least one region and to bind the resulting M constituents to the sol-gel, and is heat treated to drive off the unexposed photosensitizer and unbound X constituents and to permanently bind the M constituents to a sol-gel derived glass matrix and thereby form said glass thin film, and wherein said heat treatment is carried out in a manner that does not cause lateral shrinkage or cracking of said glass thin film.

Claim 2 (original): A thin film as in claim 1, said film being formed on a substrate having a surface including silicon and oxygen.

Claim 3 (original): A thin film as in claim 2 wherein said surface comprises SiO<sub>2</sub> and is a silica enriched thin layer on a silicon substrate.

Claim 4 (original): A thin film as in claim 1, said film being formed on a glass substrate.

Claim 5 (currently amended): A thin film as in claim 1, ~~said film where~~ wherein R is taken from a class of low-volatile organic molecules consisting of CH<sub>3</sub>, CH<sub>3</sub>-CH<sub>2</sub>, ~~and CH<sub>3</sub>-CH<sub>2</sub>-CH<sub>2</sub>~~ CH<sub>3</sub>-CH<sub>2</sub>-CH<sub>2</sub>, and ~~(Cp)~~ Cp, M is a metal taken from a class consisting of ~~metal~~ metals in ~~group~~ Groups IVA, IVB, and VIB, ~~and IVB~~, transition metals and rare earth metals, and X is a photolabile moiety taken from a class consisting of ~~and photolabile moiety including~~ halogens and carbonyls.

Claim 6 (currently amended): A thin film as in claim 3 where R comprises ~~CH<sub>2</sub>~~ CH<sub>3</sub>, M comprises Sn, and X comprises I.

Claim 7 (original): A thin film as in claim 3 wherein R comprises cyclopentadienyl.

Claim 8 (currently amended): A thin film as in claim 3 wherein M comprises ~~[[T]]~~ Ti.

Claim 9 (original): A thin film as in claim 3 wherein X comprises Cl.

Claim 10 (original): A thin film as in claim 4 wherein R comprises CH<sub>3</sub>.

Claim 11 (original): A thin film as in claim 4 wherein M comprises Pb.

Claim 12 (original): A thin film as in claim 4 wherein X comprises Cl.

Claim 13 (original): A thin film as in claim 2 including thereon a mask opaque to light in the UV and visible ranges.

Claim 14 (currently amended): A thin film of sol-gel derived glass on a silica substrate, said film including at least one metal oxide doped silica region of Si — O — M — O — Si with adjacent regions of SiO<sub>2</sub>, where M is a metal, said film having a thickness substantially in excess of one micron and being free of cracks and lateral shrinkage, and wherein said metal oxide is

photodeposited from an organometallic photosensitizer included in the sol-gel used to form said film.

Claim 15 (withdrawn): A method for forming a photosensitive sol-gel film including regions of different indices of refraction, said method comprising the steps of forming a photosensitive sol-gel film including an organometallic photosensitizer on a silica substrate, exposing said film through a mask to light of a wavelength and for a time for unbinding different amounts of metal constituents and of said sensitizer in different sections along at least a first channel thereof, exposing said film to heat at a first temperature and for a time to drive off the unbound sensitizer and to bind the metal constituents of said sol-gel film, and exposing said layer to heat at a second temperature higher than said first temperature for a time to unbind and drive off the organic constituents of said sol-gel film.